PE NUMBER: 0601108F
PE TITLE: High Energy Laser Research Initiatives

Exhibit R-2, RDT&E Budget Item Justification

DATE: February 2008

BUDGET ACTIVITY: 01 Basic Research

PE NUMBER AND TITLE: 0601108F High Energy Laser Research Initiatives

Cost ($ in Millions)	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
Total Program Element (PE) Cost	12.016	12.556	13.425	13.030	13.488	14.621	14.506	Continuing	TBD
5097 High Energy Laser Research Initiatves	12.016	12.556	13.425	13.030	13.488	14.621	14.506	Continuing	TBD

(U) A. Mission Description and Budget Item Justification

This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense (DoD) high energy laser (HEL) systems. The HEL Joint Technology Office (JTO) sends these funds to multi-disciplinary research institutes (MRIs) for projects on laser and beam control technologies. In addition, funding is spent on educational grants which are designed to stimulate interest in HELs. These educational grants are used for educational tools, scholarships, and summer intern employees in military laboratories. These funds are also used for modeling and simulation projects for the research of physics-based models of HEL systems. This program is in Budget Activity 1, Basic Research, because it funds scientific study and experimentation. Through this program, the DoD invests in research directed toward increasing knowledge and understanding in those fields of science and engineering related to long-term national security needs.

(U) B. Program Change Summary ($ in Millions)

		FY 2007	FY 2008	FY 2009
(U)	Previous President's Budget	12.356	12.636	13.735
(U)	Current PBR/President's Budget	12.016	12.556	13.425
(U)	Total Adjustments	-0.340	-0.080	
(U)	Congressional Program Reductions			
	Congressional Rescissions		-0.080	
	Congressional Increases			
	Reprogrammings			
	SBIR/STTR Transfer	-0.340		
(U)	Significant Program Changes:			

Not Applicable.

C. Performance Metrics

Under Development.

Exhibit R-2a, RDT&E Project Justification

DATE: February 2008

BUDGET ACTIVITY: 01 Basic Research

PE NUMBER AND TITLE: 0601108F High Energy Laser Research Initiatives

PROJECT NUMBER AND TITLE: 5097 High Energy Laser Research Initiatves

Cost ($ in Millions)		FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total
5097	High Energy Laser Research Initiatves	12.016	12.556	13.425	13.030	13.488	14.621	14.506	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense (DoD) high energy laser (HEL) systems. The HEL Joint Technology Office (JTO) sends these funds to multi-disciplinary research institutes (MRIs) for projects on laser and beam control technologies. In addition, funding is spent on educational grants which are designed to stimulate interest in HELs. These educational grants are used for educational tools, scholarships, and summer intern employees in military laboratories. These funds are also used for modeling and simulation projects for the research of physics-based models of HEL systems. This program is in Budget Activity 1, Basic Research, because it funds scientific study and experimentation. Through this program, the DoD invests in research directed toward increasing knowledge and understanding in those fields of science and engineering related to long-term national security needs.

(U) B. Accomplishments/Planned Program ($ in Millions)	FY 2007	FY 2008	FY 2009
(U) MAJOR THRUST: Improve the fundamental understanding of high-power laser sources, to include solid-state, free electron, and gas laser technologies.	7.110	7.498	7.993
(U) In FY 2007: Completed research projects on closed-cycle chemical, free electron, and solid state laser initiatives. Conducted fiber laser research focused on single aperture scaling single-mode fibers, and organization of multiple fibers. Conducted fundamental research on optically-pumped atomic and molecular gas lasers. Conducted a MRI call for innovative research related to gas, free electron, and solid state laser topics, awarded nine efforts.			
(U) In FY 2008: Conduct fiber laser research focused on single aperture scaling of single-mode fibers and combining multiple fibers. Conduct fundamental research on optically-pumped atomic and molecular gas lasers. Initiate research on selected topics in gas, free electron, and solid state laser technologies.			
(U) In FY 2009: Conduct fiber laser research focused on single aperture scaling of single-mode fibers and combining multiple fibers. Conduct fundamental research on optically-pumped atomic and molecular gas lasers. Conduct research on selected topics in gas, free electron, and solid state laser technologies.			
(U)			
(U) MAJOR THRUST: Improve the fundamental understanding of beam control technologies as they relate to high power laser applications. Conduct research in atmospheric characterization and beam control component technology.	2.493	2.559	2.882
(U) in FY 2007: Improved negative thermal expansion optical coating materials to match zero expansion substrates and measured thermal and strain responses of these coatings. Completed research on improving theoretical and computational atmospheric propagation effects, advanced wavefront sensing, and thermal blooming effects.			

Exhibit R-2a, RDT&E Project Justification		DATE February 2008
BUDGET ACTIVITY **01 Basic Research**	PE NUMBER AND TITLE **0601108F High Energy Laser Research Initiatives**	PROJECT NUMBER AND TITLE **5097 High Energy Laser Research Initiatves**

	B. Accomplishments/Planned Program ($ in Millions)	FY 2007	FY 2008	FY 2009
	Conducted an MRI call for innovative research related to improved beam control technology and techniques, awarded four efforts.			
(U)	In FY 2008: Complete negative thermal expansion research. Initiate research on selected topics for improved beam control technologies and techniques.			
(U)	In FY 2009: Conduct research on selected topics for improved beam control technologies and techniques.			
(U)				
(U)	MAJOR THRUST: Evaluate high-fidelity engineering models for incorporation into the HEL toolkit.	1.765	1.794	1.800
(U)	In FY 2007: Merged developed models into a common architecture through verification and validation techniques. Conducted mission-level HEL engagement scenarios and wargame HEL concepts.			
(U)	In FY 2008: Continue to develop models and merge them into a common architecture through verification and validation techniques. Conduct mission-level HEL engagement scenarios and wargame HEL concepts.			
(U)	In FY 2009: Continue to develop models and merge them into a common architecture through verification and validation techniques. Conduct mission-level HEL engagement scenarios and wargame HEL concepts.			
(U)				
(U)	MAJOR THRUST: Fund educational grants intended to simulate interest in HEL technologies among students.	0.648	0.705	0.750
(U)	In FY 2007: Provided scholarships and internships in areas directly supporting HEL research. Provided grants to service academies to stimulate HEL studies among military cadets. Provided support to K-12 school programs to stimulate science and math studies, with an emphasis on lasers and optics. Funded publication of journals and continuing education for professionals in the HEL field.			
(U)	In FY 2008: Provide scholarships and internships in areas directly supporting HEL research. Provide grants to Service Academies to stimulate HEL studies among military cadets. Provide support to K-12 school programs to stimulate science and math studies, with an emphasis on lasers and optics. Fund publication of journals and continuing education for professionals in the HEL field.			
(U)	In FY 2009: Provide scholarships and internships in areas directly supporting HEL researches. Provide grants to Service Academies to stimulate HEL studies among military cadets. Provide support to K-12 school programs to stimulate science and math studies, with an emphasis on lasers and optics. Fund publication of journals and continuing education for professionals in the HEL field.			
(U)	Total Cost	12.016	12.556	13.425

Exhibit R-2a, RDT&E Project Justification		DATE February 2008
BUDGET ACTIVITY **01 Basic Research**	PE NUMBER AND TITLE **0601108F High Energy Laser Research Initiatives**	PROJECT NUMBER AND TITLE **5097 High Energy Laser Research Initiatves**

(U) C. Other Program Funding Summary ($ in Millions)

	FY 2007 Actual	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate	Cost to Complete	Total Cost
(U) PE 0602890F, High Energy Laser Research.									
(U) PE 0603444F, Maui Space Surveillance System.									
(U) PE 0603605F, Advanced Weapons Technology.									
(U) PE 0603924F, High Energy Laser Advanced Technology Program.									
(U) PE 0602605F, Directed Energy Technology.									
(U) PE 0602120A, Sensors and Electronic Survivability.									
(U) PE 0602307A, Advanced Weapons Technology.									
(U) PE 0602624A, Weapons and Munitions Technology.									
(U) PE 0603004A, Weapons and Munitions Advanced Technology.									
(U) PE 0602114N, Power Projection Applied Research.									
(U) PE 0602702E, Tactical Technology.									
(U) PE 0603175C, Ballistic Missile Defense Technology.									
(U) PE 0603883C, Ballistic Missile Defense Boost Phase Segment.									
(U) PE 0602651M, Joint Non-Lethal									

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(U) C. Other Program Funding Summary ($ in Millions)

Weapons Applied Research.

(U) PE 0603651M, Joint Non-Lethal Weapons Technology Development.

(U) This project has been coordinated through the Reliance process to harmonize efforts and eliminate duplication.

(U) D. Acquisition Strategy

Not Applicable.